

Original Article**Developmental Profile of Infants Born to Mothers with Postpartum Depression and Anxiety: A Comparative Study****Dr Kamal Narayan Kalita***Address for Correspondence:* Dr Kamal Narayan Kalita, Dept of Psychiatry, LGB Regional Institute of Mental Health, Tezpur, Assam, Pin 784001. *E mail:* knkalita@gmail.com**ABSTRACT:**

Background: Postpartum period is associated with higher rates for depression, blues and psychosis. Anxiety is also significant. These disorders may have serious implications in the cognitive development of the infant. There is relative lack of data in this area. So we tried to estimate postpartum anxiety and depression in a group of women and tried to compare its impact on the infants' development.

Method: 100 women were assessed for depression and anxiety using Edinburgh Postnatal Depression Scale, Hospital Anxiety and Depression Scale, ICD-10 criteria. Of the three categories of these postpartum women 10 each mother infant pairs were selected and were given Communication and Symbolic Behaviour Scales Developmental Profile Infant Toddler Checklist at 6 months.

Results: 18% and 15% depression and anxiety were found respectively. Higher maternal age, parity, any post operative history correlated with it significantly. In case of infants, infants born to ill mothers were found to gain weight less as compared with that of infants born to healthy mothers. Moreover they were found to have less scores in the social, speech and symbolic composites.

Conclusion: Depression and anxiety are separate clinical conditions having significant prevalence in postpartum period. These clinical conditions have impact on the development of the infant and its early recognition may be beneficial for the newborn and the family.

INTRODUCTION:

In the WHO primary care study, prevalence of depression and anxiety was 10.4% and 10.5% respectively as found by Sartorius et al. 1996. In patients with lifetime depression, prevalence of a lifetime anxiety disorder is high (47% in Epidemiological Catchment Area Study¹; 58% in National Co-morbidity Study²; and 57% in an earlier meta analysis³). Although pure anxiety without depression is more common than pure depression without anxiety, the prevalence of depression in anxiety is still high.³

The Depressive Guideline Panel (1993a) enumerated ten primary risk factors for depression, namely- history of prior episode of depression, family history of depressive disorder, history of suicide attempt, female gender, onset of illness before 40 years, POST PARTUM PERIOD, co morbid medical illness, lack of social support, negative stressful life events, active alcohol or substance abuse.

Robinson et al discussed post-partum psychiatric disorders in three distinct categories⁴. Steiner et al reviewed about the specific link between parturition and mental illness. He suggested about a continuum of mood disturbance following childbirth; postpartum depression being the midway between severe psychotic illnesses and more common blues⁵.

There is scarce of data regarding anxiety in postpartum period. A researcher found that 4.4% met DSM-IV criteria for generalized anxiety disorder, and an additional 27.9% endorsed sub-syndromal difficulties with generalized anxiety⁶.

In recent years there has been a growing interest in postnatal depression and infant development and also on the impact of infant characteristics on the mother's mood. The neonatal period is an important period for development of mother-infant bond and the young infants are incredibly sensitive to the emotions of their caregivers. Infant react to the maternal affective state as young as 3 months with well organized behaviour and alter their behaviour in response to changes of maternal affective state. A study found that even at 2 months postpartum maternal depression influenced negatively the mother infant relationship: the depressed mothers were more negative and their babies were less positive. Depressed mothers demonstrate lower activity levels and decreased range of emotions and speak less and differently to their infants than non-depressed mothers. Mothers with postnatal depression have a flat tone of speech⁷. Less infant focused speech of these mothers is associated with poorer infant outcome and decreased optimal cognitive development⁸. There is limited data on infant outcome in case of postpartum anxiety disorders. Depressed mothers respond less to their infants and due to less feedback from mothers he becomes sad and angry. Eventually he gets less chance for exploratory nature and thus becomes less curious. Hay et al. 2001 found that infants exposed to maternal depression at 3 months age had lower IQ score at 11 years of age and needed more special attention and education.

The present study has been designed to find the prevalence of depression and anxiety in postpartum period at 6 weeks and compare the developmental profile of the infants born to them with that of infants born to mothers without any psychiatric illness at 6months.

MATERIALS AND METHOD

The present study was conducted in two settings. On the first setting, 100 women who came for their routine examination along with the infant were recruited on systematic random basis i.e. every 10th case attending the clinic were recruited. They were assessed for presence of depression and anxiety using standard protocol. The weight of the baby was noted down along with the socio demographic profile.

Again on 10th week postpartum when they came for immunization of the baby, 10 mother infant pairs from each of the three groups were selected by purposive sampling method and regular contact over telephone was maintained with them. These infants were assessed for the developmental profile at 6 months.

SELECTION CRITERIA

INCLUSION CRITERIA

The subjects meeting the following criteria were included in the study cohort-

1. Women of 18-45 years age
2. Women giving informed consent
3. Women were literate.
4. Married women.

EXCLUSION CRITERIA

Women with the following criteria were excluded from the study cohort-

1. Known chronic medical illness like asthma, chronic painful condition, hypertension, diabetes, neurological disorders, and chronic gynaecological condition like white discharge per vaginum.
2. Known chronic psychiatric illness.
3. Known malignant condition.
4. Any history of substance dependence.
5. Any evidence of psychosis in the present postpartum period.
6. Patients receiving some medication continuously for last six months except for iron and folic acid supplements.
7. Any disability causing functional impairment.
8. Birth of a congenitally malformed baby.
9. Death of the newborn.
10. Death of important family members in last six months.

TOOLS UTILIZED

A semi structured interview schedule for collecting socio-demographic and obstetrical data

- Edinburgh Postnatal Depression Scale (EPDS): EPDS was designed specifically to detect Post Partum Depression, PPD by Cox et al 1987. It contains 10 self reported items, each scoring 0-3, depending on severity. A score of 10 requires repeat of the instrument in 2 weeks and a score above 13 requires further assessment for clinical depression⁹. It has been validated in Assamese¹⁰.
- The Hospital Anxiety and Depression Scale(HADS): It is a self rating scale. This scale has two subscales viz. HADS- Depression (HADS-D) and HADS- Anxiety (HADS-A). Each subscale has seven items with rating from 0-3. A cut-off score more than or equal to 11 for each subscale is considered a definite case.
- Communication and Symbolic Behavior Scales Developmental Profile (CSBS-DP): It is a standardized tool designed to evaluate communication & symbolic abilities of children whose functional communication age is between 6 months & 2 years. It was designed to

- identify children at risk for developmental delay, delays in social communication, expressive speech/language & symbolic functioning. It may also be used to document changes over time. It consists of three components: Infant-Toddler Checklist, Caregiver Questionnaire, & Behavior Sample. We have used the Checklist questionnaire here.
- ICD-10 criteria for clinical description and diagnosis guidelines: International Classification of Diseases and Related Health Problems, 10 th revision is the current diagnostic guideline for diagnosing the health problems across the globe adopted by the World Health Organization. The chapter V(F) is related to the behavioural problems.

Analysis of data

The data obtained for the present study has been analyzed by the Fisher's exact test, chi square test, t test and ANOVA using the instat statistical package wherever applicable.

RESULT

A total of 100 women were assessed for depressive and anxiety disorders. Of the 100 women 18 were found to have depressive disorders while 15 had anxiety disorders. The relationship of sociodemographic variable and obstetrical variables with these disorders has been shown in table 1.

Women with depressive and anxiety disorders were significantly older than the non diseased group ($p < .05$). Moreover mothers with some operative history also had higher chances of getting these disorders. Mothers with higher orders of pregnancy were more prone to get depressive disorders. Both the groups consisting of mothers with depressive disorders and anxiety disorders had significantly higher score on EPDS. This association was found to be significant on Fisher's test. Again the mean score of EPDS in the depression, anxiety and no diagnosis groups were 16.11 ± 3.08 , 14.33 ± 2.52 , and 7.63 ± 2.12 . They had significant differences in mean values. But the difference of mean value of EPDS in the group having depressive and anxiety disorders was not significant.

Table 2 shows that the mean values of depression and anxiety subscales in the HADS differ significantly in the three groups. Values in the depression and anxiety Subscale in the depressed group is correlated in a weak manner ($r = .12$). But the correlation is not significant ($p > .05$). In case of depression 1% variance of symptomatology can be explained by anxiety. Similarly the correlation between anxiety and depressive symptomatology in the anxiety disorder group is not significant. In anxiety, from the co-efficient of determination we found that 20% of the variance of symptomatology can be explained by variation in the depressive symptomatology. Again in the second phase of the experiment we selected 10 women each from the three groups and the development profile of the infants were compared among them.

Table 1 – Socio-demographic and Obstetrical variables.

| | Depression n=18 | Anxiety n=15 | No diagnosis n= 67 | significance |
|---------------------------------|----------------------------|-------------------------|-------------------------------|-----------------------------------|
| Religion Hindu | 12 | 12 | 46 | p>.05 |
| muslim | 5 | 3 | 20 | |
| Family Joint | 7 | 6 | 32 | p>.05 |
| Nuclear | 11 | 9 | 35 | |
| Locality rural | 11 | 5 | 42 | p>.05 |
| Urban | 6 | 4 | 13 | |
| Semiurban | 1 | 6 | 12 | |
| Age (mean) | 28.05 | 29.0 | 23.43 | X ² =18.98 df 2 p<.05* |
| Education school | 7 | 4 | 39 | p>.05 |
| college | 11 | 11 | 28 | |
| m/o delivery spont | 8 | 3 | 37 | X ² =6.64 df 2 p<.05* |
| CS | 10 | 10 | 23 | |
| Assisted | 0 | 2 | 7 | |
| Male baby | 9 | 7 | 32 | p>.05 |
| Female baby | 9 | 8 | 35 | |
| b/o 1 st baby | 5 | 7 | 41 | X ² =6.64 df 2 p<.05* |
| 2 nd baby | 4 | 2 | 12 | |
| 3 rd baby | 9 | 3 | 12 | |
| >3 rd | 0 | 3 | 2 | |

Table 2: Scores in subscales in Hospital Anxiety Depression scale

| Category | No.of cases | HAD- depression subscale | | HAD- anxiety subscale | |
|--------------|-------------|--------------------------|---------|-----------------------|---------|
| | | Mean | Std dev | Mean | Std dev |
| Depression | 18 | 13.78 | 1.44 | 7.67 | 1.88 |
| Anxiety | 15 | 9.40 | 3.58 | 11.73 | 2.84 |
| No diagnosis | 67 | 7.48 | 1.74 | 7.01 | 2.36 |

p<0.001, ANOVA

These 10 women did not differ in the socio-demographic and obstetrical variables (Table 3). The birth weight of the infants in these 3 groups did not differ significantly (Table3). The infants to the mother's with these disorders also gained weight less significantly and at 6 months of age they had significantly lower weight as compared to the infants born to the mother's without any illness (Table3).

Table 3 : Parity, mother's age, sex and weight of the newborn

| Variable | Depressed cohort(n=10) | Anxiety cohort(n=10) | Non diagnosed cohort(n=10) |
|--------------------|------------------------|----------------------|----------------------------|
| Mother's age | 28.2±0.93 | 29.8±1.68 | 28.3±1.28 |
| Male baby | 5 | 4 | 4 |
| primipara | 3 | 5 | 6 |
| Weight at birth | 2.9±.11 | 2.76±.13 | 2.94±.09 |
| Weight at 6 months | 5.65±.12 | 5.53±.21 | 6.14±.13* |
| Weight gain | 2.67±.11 | 2.77±.11 | 3.2±.08* |

P< .05 *

The infants were rated on the CSBS DP. It was found that the mean values in the three components of the scale were significantly lower in the infants born to the mothers with illness as compared to those without illness. But these scores did not differed significantly in the infants born to mothers with depressive and anxiety disorders. Thus postpartum depression and anxiety in the mothers have negative effect on the infant's development (table 4).

Table4: CSBS-DP scores

| CSBS-DP | Depressed cohort(n=10) | Anxiety cohort(n=10) | Non diagnosed cohort(n=10) | ANOVA P value |
|-------------------|------------------------|----------------------|----------------------------|------------------|
| Social composite | 15.6±1.86 | 16.9±1.83 | 21.8±.59 | P<.05* |
| Speech composite | 3.0±.33 | 3.8±.47 | 5.9±.28 | P<.001*** |
| Symbolic composit | 2.6±.5 | 2.9±.63 | 5.4±.56 | P<.01** |
| Total score | 21.3±2.64 | 23.6±2.58 | 33.1±1.06 | P<.01** |

Some infant may score significant low in particular item while scoring higher in some other items thus the total score may not give the total developmental profile for an infant. Hence every item of the scale is important for detailed assessment.

Table5 : Infants with less than cut off scores in CSBS DP

| Cut off scores | Depressed cohort(n=10) | Anxiety cohort(n=10) | Non diagnosed cohort(n=10) |
|-------------------------|------------------------|----------------------|----------------------------|
| Social composite (<8) | 1 | 1 | 0 |
| Speech composite(<2) | 1 | 0 | 0 |
| Symbolic composite(<3) | 4 | 3 | 1 |
| Total score (<13) | 1 | 2 | 0 |

Table 5 shows the number of infants who score lower than the cut off score in different composite. In the depressed cohort, 4 infant's scores were of concern in the symbolic composite while only one's total score was of concern.

DISCUSSION

While selecting the subjects we included women above legal age for marriage. Use of multiple self report inventories forced us to exclude illiterate women from the study. We found depression and anxiety disorders in 18% and 15 % of the cases. Higher prevalence has been observed in many studies done earlier both western and eastern^{11,12}. Similar finding was found in Nigerian women¹³. In a study done in India it was found that higher prevalence of depression exists in postpartum period and significant association with antepartum depression also exists¹⁴. Anxiety disorders were also higher in the postpartum period. Higher prevalence has been reported in many studies and we are in similar line with the previous findings^{15,16,17}. A study done in Assam reported 11% of generalized anxiety disorders in mothers attending a postpartum clinic¹⁸. Hence both anxiety and depressive disorders are of concern in postpartum women. These disorders are found in mothers with older age group as compared with the young mothers. This goes against findings of a previous study done by Chandram et al. He reported the mean age for onset of depression to be 22.8 years¹⁹. Our finding may be the result of the sampling procedure because we excluded the mothers below 18 years in our study. The significant relationship of anxiety and depression with operative history goes in line with the previous findings^{20,21}. This might be due to the somatic symptoms found in postoperative women which correspond to the somatic symptoms found in depressive disorders. Another interesting finding of the study is that as the birth order increases the chances of depression also increases. Forman et al. reported similar finding²². On the other hand anxiety disorders were higher in first time mothers. It goes in line with previous findings of Maes et al²³. These results are self explanatory. In a poor country like us the entry of a new born in the family carries lots of economic burden so the mother may be concerned with that. Our finding did not found any significant relationship of the sex of the newborn to these disorders. But a researcher from India reported about higher prevalence of depressive illness if the newborn was a female²⁴. On the other hand another Indian researcher reported about no significant relationship between maternal depression and her preference for male or female baby¹⁹. This result can be explained from cultural aspects of the north eastern part of India.

Higher scores in the EPDS both in the anxiety and depression group goes in line with previous findings^{9,25}. A researcher in India reported sensitivity of 88.89% and specificity of 85.37% of EPDS in detecting postpartum depression¹⁰. Ross et al commented that it can be regarded as a good tool for assessing anxiety in postpartum period also²⁵.

In the HADS the scores for depression and anxiety differed significantly. However no significant correlation between the anxiety and depressive symptoms was observed. In case of depression 1% variance of symptomatology can be explained by anxiety and in anxiety, 20% of the variance of symptomatology can be explained by variation in the depressive symptomatology. It establishes that anxiety and depression are separate categories of disorders in postpartum period. Matthey et al. voiced in similar manner and suggested the term 'postnatal mood disorders' for the psychiatric problems in the postpartum period²⁶.

The infants selected for assessing development were matched properly with respect to weight, sex, mother's age and parity. All were breastfed. Weight at 6 months and the weight gain differed significantly as compared to the infants born to healthy mothers. But a researcher reported of no significant weight difference at 3 months of age²⁷. No significant difference between weight gains was observed in the infants born to anxious and depressed mothers. Murray reported of insecure attachment between mother and infant in case of postpartum depression⁸. This may be related to poor feeding and even food rejection by the infant. Significant differences in the mean values for all the composites were observed in the three test groups. In the CSBS DP infant toddler checklist, the social composite comprises of the score of emotion & eye gaze, communication and gesture. In the present study we got significant difference in the infants to the diseased mother as compared to that of non diseased mother but if the comparison is done individually among the three groups then only infants born to depressed mother and non depressed mother differed significantly. Same observations were made in case of scores on gesture too. Scores in communication subscale did not differ significantly in three groups. In case of speech composite scores of sounds and words are taken into account. Similar observation is found in the score of sound subscale among the three groups as found in scores of emotion- eye gaze and gesture. Again in the symbolic composite scores of subscale for understanding and object use are composited. We found significant difference in the scores for object use in the infants born to depressed and anxious mothers as compared to infants born to non diseased mothers. Here we found significant difference in the score between the infants born to depressed mothers as compared to the infants born to anxious mothers. Murray et al reported of poorer object concept in infants born to mothers with depression at 9 months of age⁸. Studies correlating it in case of maternal anxiety are scarce. He reported that maternal education and higher social status are beneficial for infant's development. On language comprehension he did not find any significant correlation but girls were found to outnumber the boys in it. CSBS DP infant toddler checklist is an instrument that should be applied every 3 months to the infants of the age group 6 months to 3 years. But scores that are of concern may aid the parents in identifying the 'would be problem child' earlier and thus to seek help earlier for better outcome.

Strengths of the study

- It looks into the anxiety problems in postpartum period. There is lack of data in this area in our country.
- We have few studies that examine the relationship of maternal illness on infant's development. It is done in prospective manner for this assessment which strengthens this study further.

Limitations of the study

- There was no antepartum assessment for these disorders.
- There is less number of subjects for assessing the development in the three groups.
- There may be bias in the reporting of the caregiver in CSBS DP infant toddler checklist.

In spite of these shortcomings we have the strength of being unique in this area. A collaborative study with progressive correlation may be an area of research in future.

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